## Lesson 18: Expressions with Rational Numbers

Let’s develop our signed number sense.

### 18.1: True or False: Rational Numbers

Decide if each statement is true or false. Be prepared to explain your reasoning.

1. is negative

### 18.2: Card Sort: The Same But Different

Your teacher will give you a set of cards. Group them into pairs of expressions that have the same value.

### 18.3: Near and Far From Zero

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | 6 |  |  |  |  |  |  |
|  | -6 |  |  |  |  |  |  |
| -6 |  |  |  |  |  |  |  |

1. For each set of values for and , evaluate the given expressions and record your answers in the table.
2. When and , which expression:

* has the largest value?
* has the smallest value?
* is the closest to zero?

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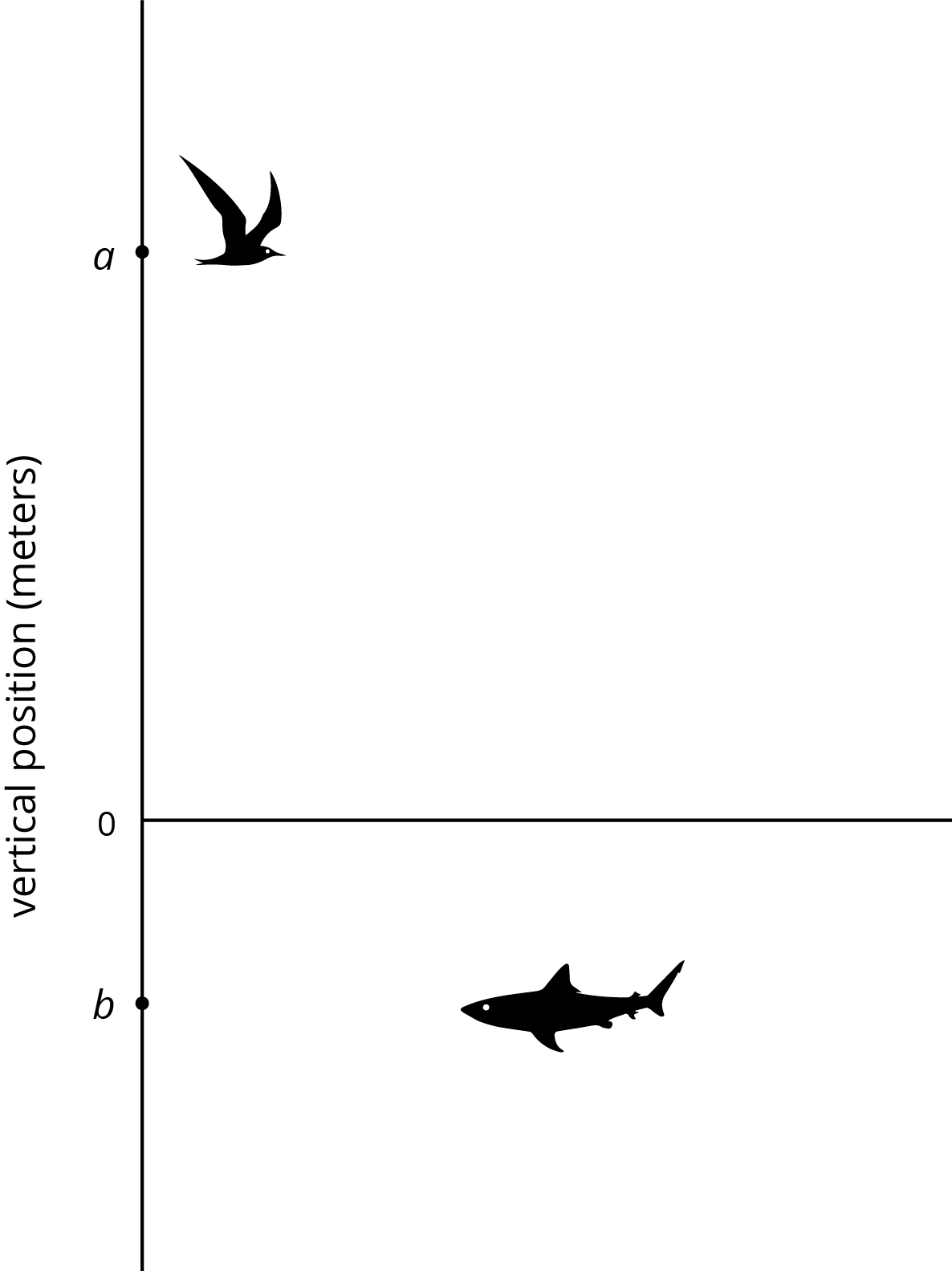
1. When and , which expression:

* has the largest value?
* has the smallest value?
* is the closest to zero?

#### Are you ready for more?

Are there any values could you use for and that would make all of these expressions have the same value? Explain your reasoning.

### 18.4: Seagulls and Sharks Again



A seagull has a vertical position , and a shark has a vertical position . Draw and label a point on the vertical axis to show the vertical position of each new animal.

1. A dragonfly at , where
2. A jellyfish at , where
3. An eagle at , where .
4. A clownfish at , where
5. A vulture at , where
6. A goose at , where

### Lesson 18 Summary

We can represent sums, differences, products, and quotients of **rational numbers**, and combinations of these, with numerical and algebraic expressions.

Sums:

Differences:

Products:

Quotients:

We can write the product of two numbers in different ways.

* By putting a little dot between the factors, like this: .
* By putting the factors next to each other without any symbol between them at all, like this: .

We can write the quotient of two numbers in different ways as well.

* By writing the division symbol between the numbers, like this: .
* By writing a fraction bar between the numbers like this: .

When we have an algebraic expression like and are given a value for the variable, we can find the value of the expression. For example, if is 2, then the value of the expression is -4.25, because .



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